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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,472	12/31/2003	Osvaldo Colavin	03-LJ-038	3927

7590  
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EXAMINER

LAI, VINCENT

ART UNIT

PAPER NUMBER

2181

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/08/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/749,472	<b>Applicant(s)</b> COLAVIN ET AL.	
	<b>Examiner</b> Vincent Lai	<b>Art Unit</b> 2181	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

*[Signature]*  
FRITZ FLEMING  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100  
1/4/2007

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-5 7-20 rejected under 35 U.S.C. 102(b) as being anticipated by Guttag et al (U.S. Patent # 5,590,350), herein referred to as Guttag.

As per **claim 1**, Guttag discloses a method for supporting software pipelining, comprising:

receiving a shift mask signal (See figure 5 and table 23 in columns 61 and 62: A shift mask signal would be part of an instruction that is passed through the circuitry. The functional signal generator 245 receives a decoded instruction from the instruction decode logic 250. For example, the A+(B&C) function, found in column 6 (5<sup>th</sup> function in the table) has a C shift mask);

receiving a shift signal (See figure 5 and table 23 in columns 61 and 62: Circuitry is configured to receive instructions, including shift instructions. The functional signal generator 245 receives a decoded instruction from the instruction decode logic 250. For example, the A+(B&C) function, found in column 6 (5<sup>th</sup> function in the table) has a A+B shift signal);

identifying a shifting register queue based on the shift mask signal the shifting register queue comprising a plurality of queue registers (See figure 8: 32 shifting registers are shown in the figure, which are attached in a queue-like fashion. Guttag already teaches similar functionality when it comes to the barrel rotator and that “a controllable shifter is an alternate to the barrel rotator” (See abstract)); and

shifting the contents of the queue registers based on the shift signal (See figure 5 and table 23 in columns 61 and 62: Circuitry is configured to execute instructions, including shift instructions. The functional signal generator 245 receives a decoded instruction from the instruction decode logic 250. The system will perform the instruction as decoded).

[Examiner's note: All references to rotators in the Guttag reference from here are out are meant to encompass shifters per the disclosure that “a controllable shifter is an alternate to the barrel rotator” (See abstract)].

As per **claim 2**, Guttag discloses the method of claim 1, receiving the shift mask signal comprising receiving the shift mask signal from a shift mask register (See figure 5 and column 24, lines 33-38: Guttag teaches that a rotation register feeds the ALU with instructions indicate a rotation is necessary and thus if a rotator was replaced with a shifter, one having ordinary skill in the art would recognize that the same basic functionality would also be used with a shifter).

As per **claim 3**, Gutttag discloses the method of claim 1, receiving the shift signal comprising receiving the shift signal from an external component (See figure 1 and 5: A shift instruction can be introduced from an external source. One having ordinary skill in the art would recognize that a shift instruction could be inputted/coded by a user).

As per **claim 4**, Gutttag discloses the method of claim 1, the shifting register queue part of a register file (See figure 8: The rotation queue is part of the register file and thus one having ordinary skill would also have shift register queues a part of the register file when using shifters as alternates to rotators), the register file comprising the plurality of queue registers and comprising a plurality of non-queue registers (See figure 5 and 8: the queue registers are only a part of the registers), the shift mask signal comprising a plurality of bits (See table 23, in columns 61 and 62, column 60, line 62-column 61, line 7, and the abstract), each bit associated with a corresponding register in the register file (See column 5, lines 46-67: The mask is used to locate positions in the rotation queue and it would be obvious to one having ordinary skill in the art to have the mask such that each bit would correspond to a register).

As per **claim 5**, Gutttag teaches the method of claim 4, the bits in the shift mask signal corresponding to the queue registers comprising 1s, and the bits in the shift mask signal corresponding to the non-queue registers comprising 0s (See figure 8 and column 5, lines 46-67: Gutttag already teaches similar functionality when it comes to the barrel rotator and that "a controllable shifter is an alternate to the barrel rotator" (See

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abstract). 1's are used to identify in the rotation register mask, which could also be done a shift register mask).

As per **claim 7**, Guttag teaches a system for supporting software pipelining, comprising a register file comprising a plurality of registers (See figures 5 and 8), the registers comprising queue registers and non-queue registers (See figure 5 and 8: the queue registers are only a part of the registers), the queue registers forming a shifting register queue (See figure 8: Guttag already teaches similar functionality when it comes to the barrel rotator and that "a controllable shifter is an alternate to the barrel rotator" (See abstract)), at least one non-queue located register located between two queue registers (See figure 5 and 8: Not all of the registers are queue registers).

**Claims 8 and 9** are rejected for reasons similar to that of claim 5 as claims 8-9 are the system implementing the methods of the latter portion of claim 5.

As per **claim 10**, Guttag discloses the system of claim 7, the register file further comprising write decoding logic and a plurality of multiplexers, the write decoding logic operable to generate control signals and write signals, each multiplexer corresponding to a register within the register file, each multiplexer operable to receive one of the control signals from the write decoding logic and to provide write data to the corresponding register based on the control signal (See figure 5: Multiplexer and decoders are available to the register file).

As per **claim 11**, Guttag discloses the system of claim 10, the registers within the register file comprising edge-triggered flip-flops, each register operable to receive the write data from the multiplexer and to receive one of the write signals from the write decoding logic (One having ordinary skill in the art would recognize that an edge-triggered flip-flop can be used as a register).

As per **claim 12**, Guttag discloses the system of claim 11, for each register other than a first register, the write data provided by each multiplexer to the corresponding register based on the control signal comprising data from a previous register in the register file (See figure 8: This is a rotation of data, which is taught by Guttag).

**Claim 13** is rejected for reasons similar to that of claims 1 and 7. Claim 13 is a system that combines the system of claim 7 with the method of claim 1.

**Claim 14** is rejected for reasons similar to that of claim 8 as they contain the same word-for-word limitations.

**Claim 15** is rejected for reasons similar to that of claim 9 as they contain the similar limitations.

**Claim 16** is rejected for reasons similar to that of claim 4 as claim 16 is the system implementing the methods of the latter portion of claim 4.

**Claims 17-19** are rejected for reasons similar to that of claims 10-12 as they contain the same word-for-word limitations.

**Claim 20** is rejected for reasons similar to claim 3. Claim 20 is the system that is used to implement the method of claim 3.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Guttag.

As per **claim 6**, Guttag teaches the method of claim 4.

Guttag does not teach using 0's to identify bits.

Guttag does teach a using 1's to identify bits (See rejection of claim 5).

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Guttag include the bits in the shift mask signal corresponding to the queue registers comprising 0s, and the bits in the shift mask signal



corresponding to the non-queue registers comprising 1s (See column 5, lines 46-67: 1's are used to identify in the rotation register mask, but one having ordinary skill in the art could easily implement a mask where 0's are used to identify, which could also be done a shift register mask).

### ***Conclusion***

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vincent Lai whose telephone number is (571) 272-6749. The examiner can normally be reached on M-F 8:00-5:30 (First BiWeek Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fritz M. Fleming can be reached on (571) 272-4145. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Vincent Lai

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vi

December 28, 2006

Examiner

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